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| 10/651,055      | 08/28/2003  | Rahul Mital          | 8317-18             | 8992             |

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EXAMINER

TRAN, DIEM T

ART UNIT PAPER NUMBER

3748

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/651,055

Applicant(s)

MITAL ET AL.

Examiner

Diem Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

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## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

***Claims 2, 3, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Boegner et al. (US patent 6,318,073).***

Regarding claim 2, Boegner discloses an internal combustion engine aftertreatment system for treating exhaust gases exiting an engine, the system comprising:

a valve system having a valve input operatively coupled to the engine exhaust, first valve output (12) and having a second valve output (14);

an adsorber (11) having an adsorber input operatively coupled to the first valve output and having an adsorber output (see Figure 1); and

a bypass pathway (4b) having a bypass input operatively coupled to the second valve output and having a bypass output operatively coupled to the adsorber output (see Figure 1).

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Regarding claim 3, Boegner further discloses a sulfur trap (9) having a sulfur trap coupled to the engine exhaust and having a sulfur trap output operatively coupled to the valve system input (see Figure 1, col. 4, lines 21-23).

Regarding claim 8, Boegner further discloses a temperature (10) and lamda sensor (8) having a sensor input operatively coupled to the valve system input.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Claim 4, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. (US patent 6,318,073) in view of Hirota et al. (US Patent 6,233,927).***

Regarding claim 4, Boegner discloses all the claimed limitations as discussed in claim 3 above; however, fails to disclose a catalytic soot filter coupled to the downstream of the sulfur trap. Hirota' 927 teaches that it is conventional in the art, to utilize a soot filter which can absorb SOx (like sulfur trap) located upstream of the valves in the exhaust gas system (see col. 3, lines 46-50, col. 5, lines 37-38).

It would have been obvious to one having ordinary skill in the art at the

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time the invention was made, to utilize said sulfur trap and soot filter in one instead of soot filter coupled downstream of sulfur trap, since the new location of the sulfur trap is merely repositioning known parts in an exhaust system and such is shown to be conventional by Hirota.

Regarding claim 10, Boegner device discloses all the claimed limitations as discussed in claim 2 above; however, fails to disclose the valve system comprises a proportional control 3-way valve. Hirota teaches that it is conventional in the art, to utilize a proportional control 3-way valve (15) in the exhaust gas system (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized a 3- way control valve as taught by Hirota, in the Boegner device, since the use thereof would have saved the cost of using multiple valves to control the exhaust gas flow through bypass.

***Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. (US patent 6,318,073) in view of Zahn et al. (US Patent 5,613,359).***

Boegner discloses all the claimed limitations as discussed in claim 2 above, however, fails to disclose a diesel oxidation catalyst having an input operatively coupled to the adsorber and to the bypass output. Zahn teaches that it is conventional in the art, to utilize a diesel oxidation catalyst coupled to the adsorber and to the bypass output (see Figure 1).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Zahn in the Boegner device, since the use thereof would have prevented inadvertent release of harmful emissions into the atmosphere.

***Claims 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. (US patent 6,318,073) in view of Kume et al. (JP 60-45711).***

Regarding claim 6, Boegner discloses all the claimed limitations as discussed in claim 2 above, however, fails to disclose a fuel injector having an injector coupled to the adsorber input. Kume teaches that it is conventional in the art, to utilize a fuel injector (8) operatively coupled to the adsorber input (see Figure 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized a fuel injector having an injector output operatively coupled to the adsorber input as taught by Kume, in the Boegner device, since the use thereof would have provided additional fuel to the exhaust gas to improve the regeneration of the adsorbent.

Regarding claim 7, Kume further teaches an igniter (9) operatively coupled to the adsorber input.

***Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. (US patent 6,318,073) in view of Khair et al. (US patent 6,293,096).***

Boegner discloses all the claimed limitations as discussed in claim 2 above, however, fails to disclose an NOx sensor coupled to the adsorber output. Khair teaches that it is conventional in the art, to utilize an NOx sensor (50) downstream of the adsorber (22) (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized a NOx sensor as taught by Khair, in the Boegner device, since the use thereof would have provide a means to regulate the fuel added to the exhaust gas to regenerate the NOx adsorbent.

***Claims 11, 14, 18, 19, 21, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (US Patent 5,974,791).***

Regarding claims 11, 19, Hirota discloses an internal combustion engine aftertreatment system for treating exhaust gases exiting an engine, the system comprising:

a valve system having a valve input operatively coupled to the engine exhaust (see Figure 1);

a catalytic soot filter and adsorber (10a) having an input operatively coupled to the valve system output (see Figure 1); and

a bypass pathway (6b) having a bypass input operatively coupled to the second valve output and having a bypass output operatively coupled to the

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adsorber output (see Figure 1); however, fails to disclose said adsorber coupled downstream or upstream of soot filter.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to utilize a soot filter and an adsorber in one instead of adsorber coupled downstream or upstream of soot filter, since the new location of the adsorber is merely repositioning known parts in an exhaust system and such is shown to be conventional by Hirota.

Regarding claims 14, 21, Hirota further discloses a fuel injector coupled to the soot filter input (see Figure 1).

Regarding claims 18, 25, Hirota discloses the valve system comprising a 3-way control valve in the exhaust gas bypass system (see Figure 1).

***Claims 12, 16, 20, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (US Patent 5,974,791) as applied to claims 11, 19 above, in view of Hirota et al. (US patent 6,502,391).***

Regarding claims 12, 20, Hirota discloses all the claimed limitations as discussed in claims 11, 19 above, however, fails to disclose a sulfur trap coupled to the valve system input. Hirota'391 teaches that it is conventional in the art, to utilize a sulfur trap (17) having a sulfur trap input operatively coupled to the engine exhaust and having a sulfur trap output operatively coupled to the valve system input (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Hirota' 391, in the



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Hirota' 791 device, since the use thereof would have reduced the sulfur component in the exhaust gas so as to improve the efficiency of the emission control system.

Regarding claims 16, 23, Hirota discloses all the claimed limitations as discussed in claims 11, 19 above, however, fails to disclose a temperature sensor coupled to the valve system input. Hirota'391 teaches that it is conventional in the art, to utilize a temperature (29) having a sensor input operatively coupled to the valve system input

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Hirota' 391, in the Hirota' 791 device, since the use thereof would have provided a means for detecting the temperature of the exhaust gas.

***Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (US Patent 5,974,791) as applied to claim 11 above, in view of Zahn et al. (US patent 5,613,359).***

Regarding claim 13, Hirota discloses all the claimed limitations as discussed in claim 11 above, however, fails to disclose diesel oxidation catalyst having an input operatively coupled to the adsorber output and to the bypass output. Zahn teaches that it is conventional in the art, to utilize a diesel oxidation catalyst (3) coupled to the adsorber output and to the bypass output (see Figure 1).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Zahn, in the Hirota device, since the use thereof would have prevented inadvertent release of harmful emissions into the atmosphere.

***Claims 15, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (US Patent 5,974,791) as applied to claims 14, 21 above, in view of Kume et al. (JP 60-045711).***

Regarding claims 15, 22, Hirota discloses all the claimed limitations as discussed in claims 14, 21 above, however, fails to disclose an igniter coupled to the soot filter input. Kume teaches that it is conventional in the art, to utilize an igniter coupled to the soot filter input (9) (see Figure 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized an igniter upstream of the soot filter as taught by Kume, since the use thereof would have provided a means for igniting the additional fuel supplied to the exhaust gas to increase the temperature of the filter.

***Claims 17, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (US patent 5,974,791) as applied to claims 11, 19 above, in view of Khair et al. (US patent 6,293,096).***

Regarding claims 17, 24, Hirota discloses all the claimed limitations as discussed in claims 11, 19 above, however, fails to disclose an NOx sensor

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coupled to the adsorber output. Khair teaches that it is conventional in the art, to utilize an NOx sensor (50) coupled to the adsorber output (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized a NOx sensor as taught by Khair, in the Hirota device, since the use thereof would have provided a means to control the fuel added to the exhaust gas to regenerate the NOx adsorbent.

***Claims 1, 26, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zahn et al. (US patent 5,613,359) in view of Hirota et al. (US Patent 6,233,927).***

Regarding claims 1, 26, Zahn discloses an internal combustion engine aftertreatment system for treating exhaust gases exiting an engine, the system comprising:

a valve system having a first valve (8) output and having a second valve (7) output (see Figure 1);

an adsorber (6) having an adsorber input operatively coupled to the first valve output and having an adsorber output;

a bypass pathway having a bypass input operatively coupled to the second valve output and having a bypass output operatively coupled to the adsorber output (see Figure 1); and a oxidation catalyst (3) coupled to the adsorber output and to the bypass output; however, fails to disclose a sulfur trap and a catalytic soot filter located between the engine exhaust and the valve system. Hirota'927 teaches that it is conventional in the art, to utilize a soot filter

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(7) which can absorb SO<sub>x</sub> (like sulfur trap) coupled upstream of the valves in the exhaust gas system (see Figure 1, col. 3, lines 46-50, col. 5, lines 37-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to utilize said sulfur trap and soot filter in one instead of soot filter coupled downstream of sulfur trap, since the new location of the sulfur trap is merely repositioning known parts in an exhaust system and such is shown to be conventional by Hirota.

Regarding claim 31, Hirota further teaches that a proportional control 3-way valve (15) (see Figure 1).

***Claims 27, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zahn et al. (US patent 5,613,359) in view of Hirota et al. (US Patent 6,233,927) as applied to claim 26 above, and further in view of Kume et al. (JP 60-045711).***

Regarding claims 27, 28, the modified Zahn device discloses all the claimed limitations as discussed in claim 26 above, however, fails to disclose a fuel injector and an igniter coupled to the adsorber input. Kume teaches that it is conventional in the art, to utilize a fuel injector (8) and an igniter (9) located upstream of the adsorber (see Figure 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Kume in the modified Zahn device, since the use thereof would have provided means for heating and regenerating the emission control device.

***Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zahn et al. (US patent 5,613,359) in view of Hirota et al. (US Patent 6,233,927) as applied to claim 26 above, and further in view of Boegner et al. (US patent 6,318,073).***

The modified Zahn device discloses all the claimed limitations as discussed in claim 26 above, however, fails to disclose a temperature and a lamda sensor coupled to the valve system input. Boegner teaches that it is conventional in the art, to utilize a temperature (10) and lamda sensor (8) coupled to the valve system input (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized a temperature and a lambda sensor as taught by Boegner, in the modified Zahn device, since the use thereof would have provided a means to detect temperature and air fuel ratio of the exhaust gas.

***Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zahn et al. (US patent 5,613,359) in view of Hirota et al. (US Patent 6,233,927) as applied to claim 26 above, and further in view of Khair et al. (US patent 6,293,096).***

The modified Zahn device discloses all the claimed limitations as discussed in claim 26 above, however, fails to disclose an NOx sensor coupled

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to the adsorber output. Khair teaches that it is conventional in the art, to utilize an NOx sensor (50) downstream of the adsorber (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized a NOx sensor downstream of the adsorber as taught by Khair, in the modified Zahn device, since the use thereof would have provided a means to regulate the fuel added to the exhaust gas to regenerate the NOx adsorbent.

### Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (703) 308-6073. The examiner can normally be reached on Monday -Friday from 8:30 a.m.- 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

DT  
May 27, 2004



Diem Tran  
Patent Examiner  
Art unit 3748



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